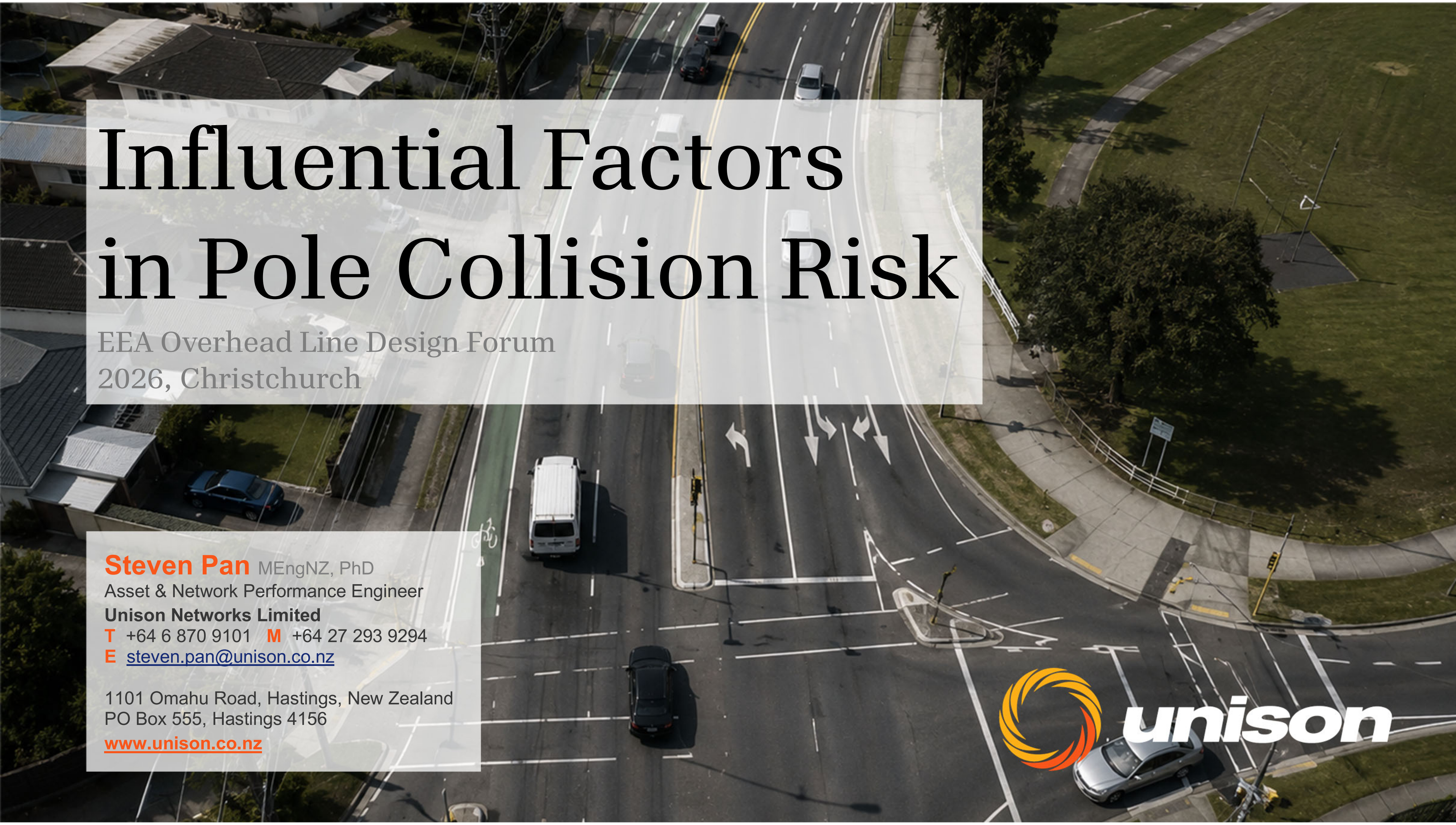

Influential Factors in Pole Collision Risk

EEA Overhead Line Design Forum
2026, Christchurch

Steven Pan MEngNZ, PhD
Asset & Network Performance Engineer
Unison Networks Limited
T +64 6 870 9101 **M** +64 27 293 9294
E steven.pan@unison.co.nz

1101 Omahu Road, Hastings, New Zealand
PO Box 555, Hastings 4156
www.unison.co.nz

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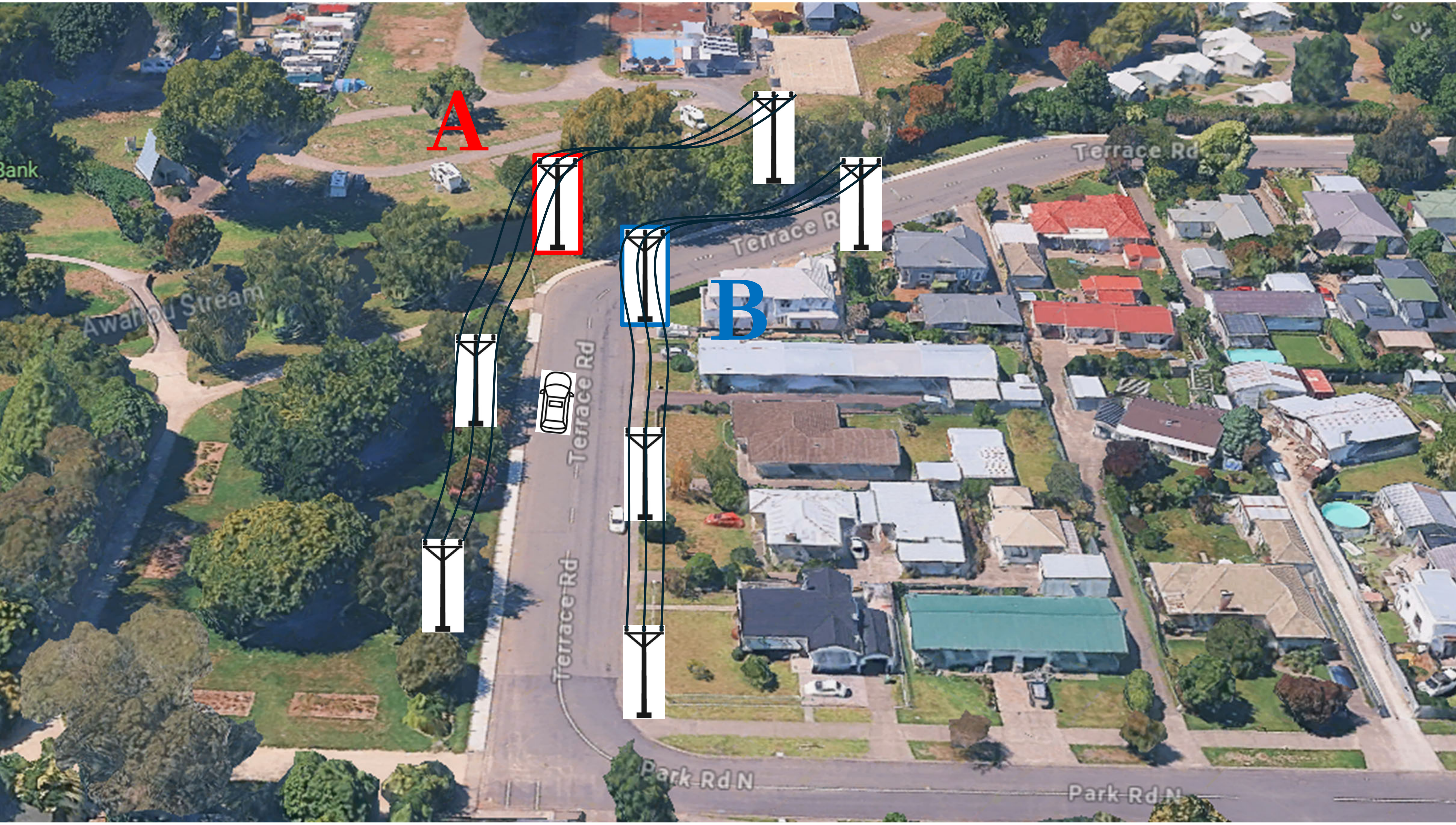

A
B
Terrace Rd
Terrace Rd
Terrace Rd
Terrace Rd
Park Rd N
Park Rd N
Awahou Stream
Bank

Motivation, Context, Stats, and Goal

— *Motor Accident contributed to 5% of SAIDI in Financial Year 26, ranking 5th among 32 sub-causes*

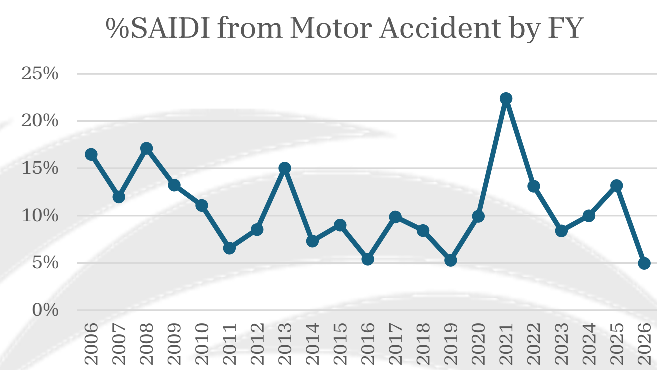
— *Average cost per incident is approx. $12k and cost recoup can be difficult*

— *Public Health & Safety concern*

— *Not EDB's fault but we could reduce the impact or likelihood*

— *There is a rich dataset around traffic incident readily available from NZTA*

➢ *Understanding the influential pole collision factors helps **foster a pole placement strategy against such a risk***



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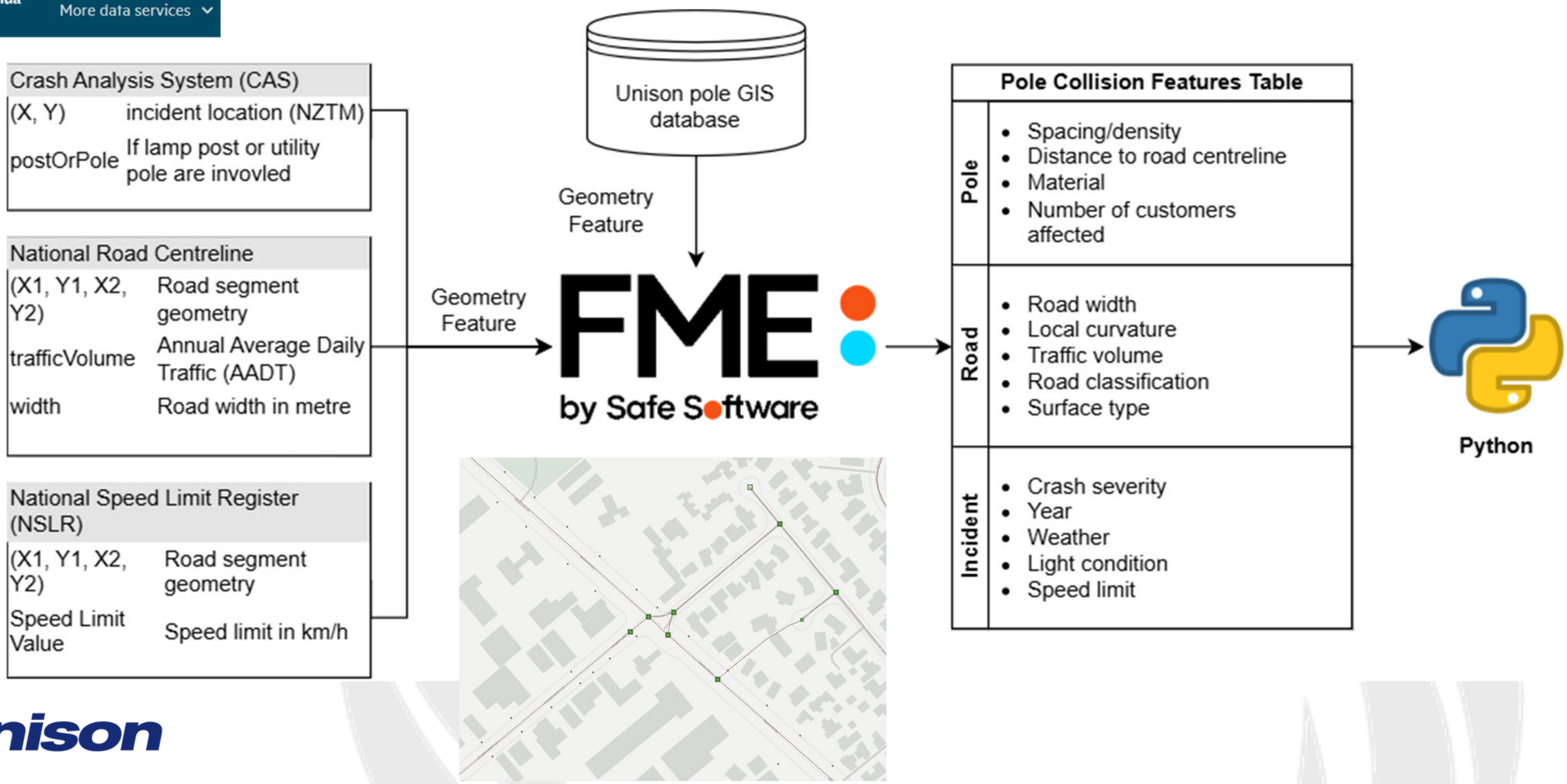
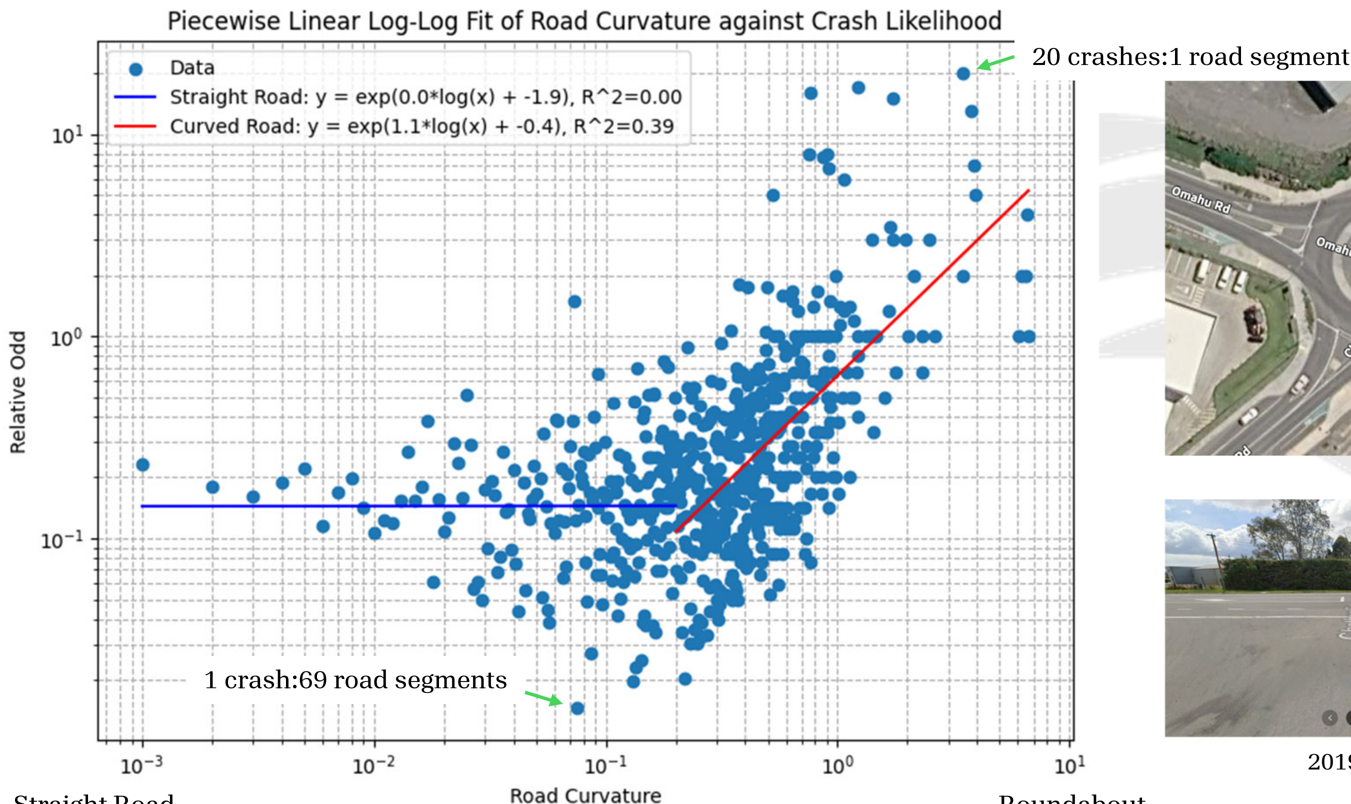
Workflow Overview



Effect of Road Curvature on ALL Crashes*



2019 street view

Straight Road

Roundabout

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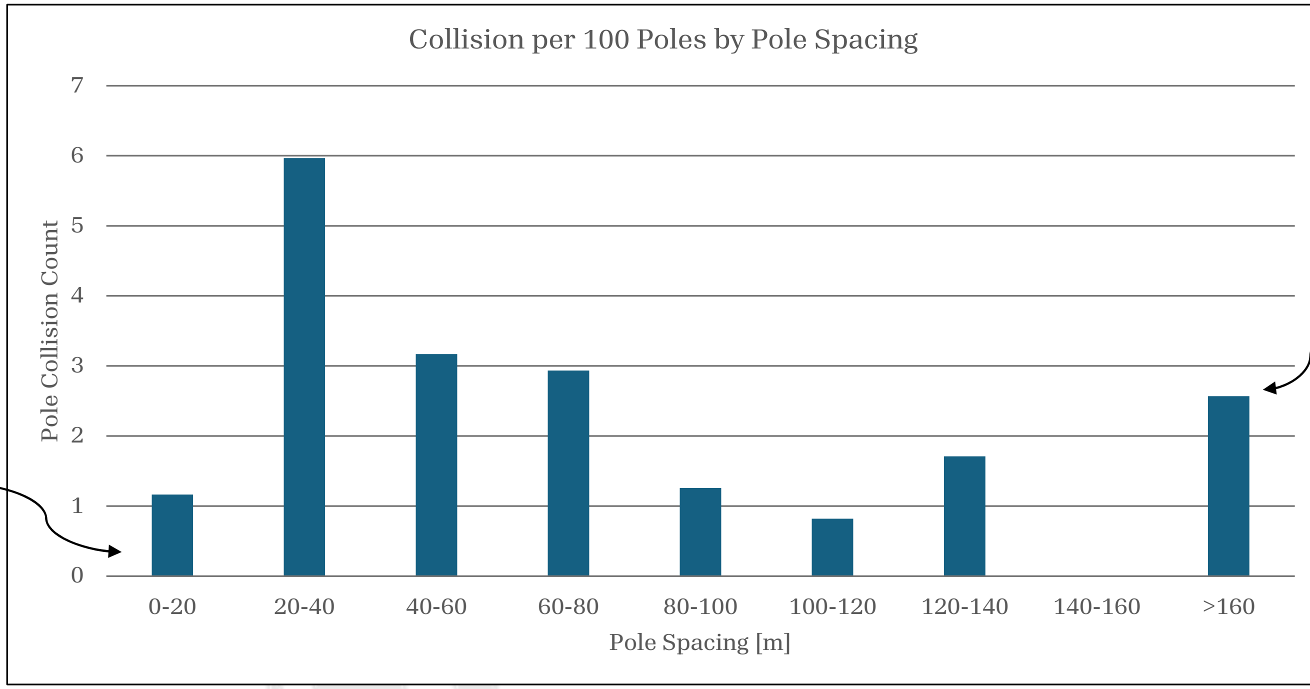
*Within Unison Network operational regions.

Effect of Pole Spacing on Pole Collision*

Residential area with
LV road-crossing poles,
low traffic volume



Long tail
accumulation

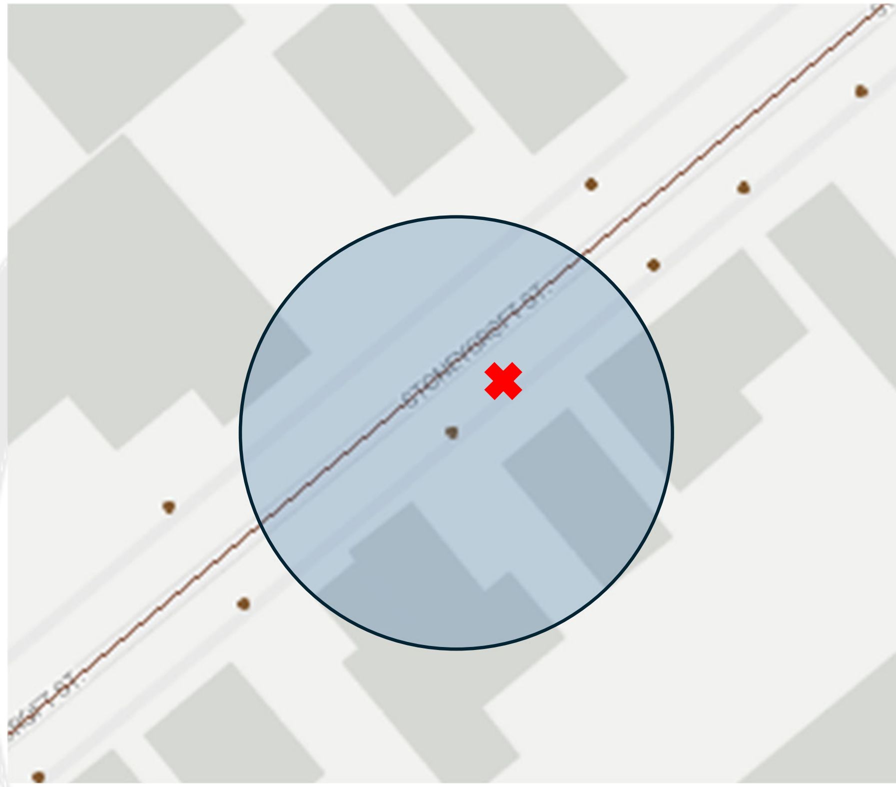
1. Pole spacing is on a per road basis, e.g., 16 poles on a 723 m long Allen Road, regardless of which side of the road the poles are on.
2. Pole Collision := (postOrPole > 0) AND (crash location ≤ 20m to pole)

*Hastings only

Crash Association to Poles

1. Get the closest pole to the crash where (postOrPole > 0)

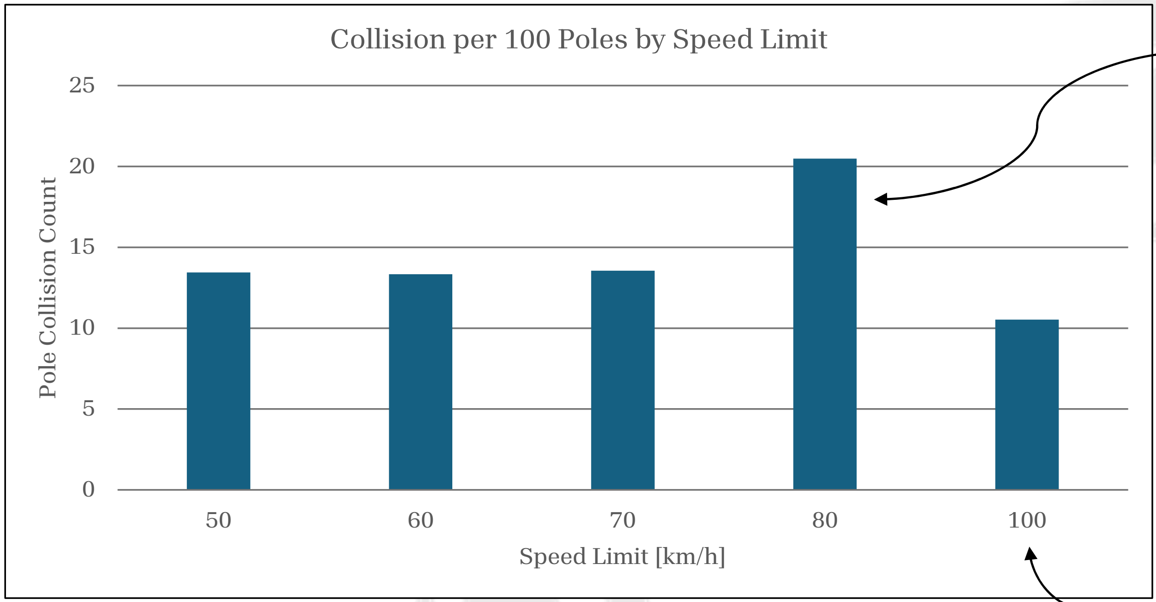
2. Verify IF distance ≤ 20m



Pole location

Crash location

Effect of Speed Limit on Pole Collision*

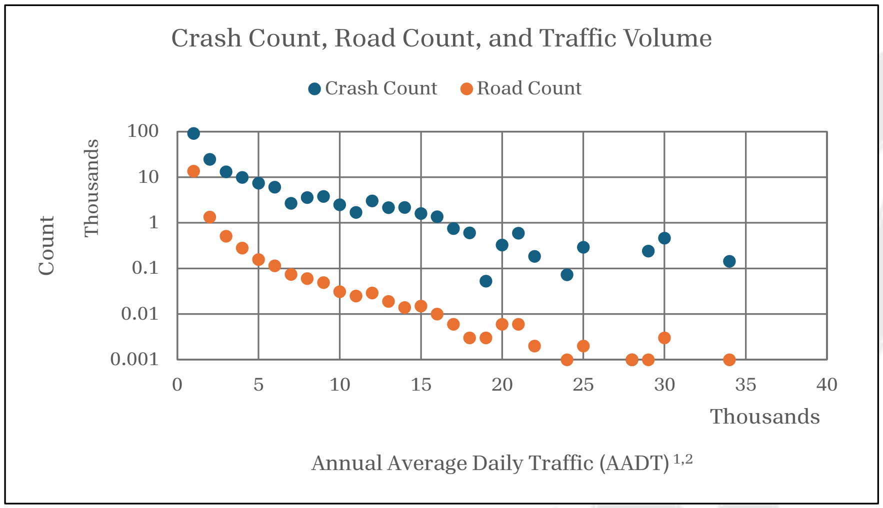


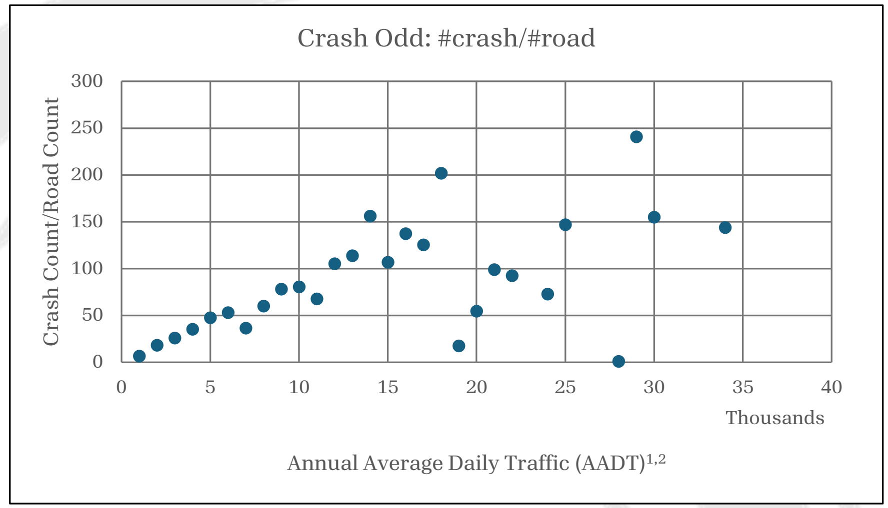
Pakowhai Road
80km/h
Arterial
12k AADT
Un-barriered

SH is often barriered,
not many poles around

*Hastings only

Effect of Traffic Volume on Car Incident*



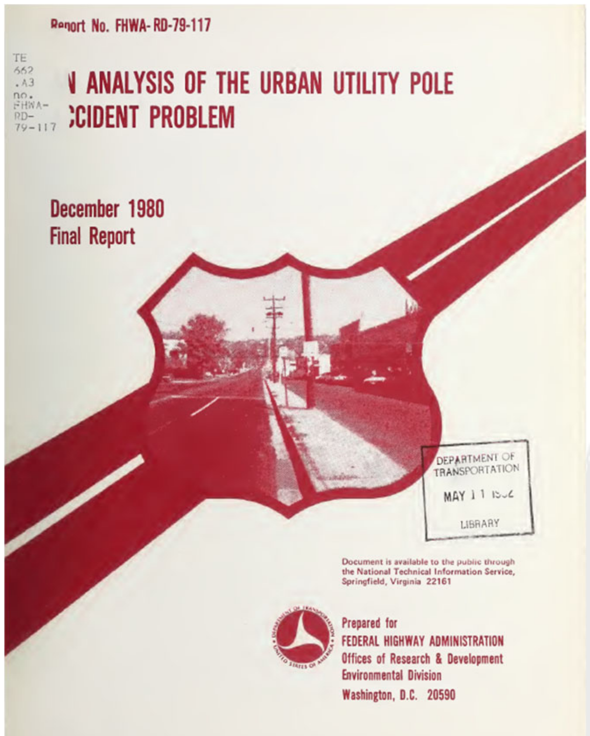


[1]AADT is grouped into bins of 1000

[2]NZTA's road class by AADT: National (>25k), Arterial (>5k), Secondary Collector (>1k)

*For the whole country

Supporting Research



Undergrounding new power lines or routing them between backyards should be strongly encouraged wherever possible; it is interesting to note the utility companies in the areas which had the lowest proportion of utility pole accidents in single vehicle accidents, also followed such a policy. Where the above countermeasures are not possible, good judgement (and careful planning) should be exercised in erecting power lines along roadways. For instance, the utility pole accident problem can be partially alleviated by confining power lines to only one side of the road; necessary support poles on the opposite side should be located as far away as possible from the road edge. Additional benefits can be realized by running power lines along the insides of curves, since it was shown that vehicles exited the roadway more frequently on the outside of curves.

Jones, Ian Shore and Baum, A. Stephen (1980). *An analysis of the urban utility pole accident problem.*

So, what did we learn and what can we do?

1. Road curvature affects general incident likelihood
   - Consider reducing pole density near sharp bends
2. Pole collision likelihood reduces with larger pole spacings
   - In accordance with the first suggestion, consider increasing pole spacings within design limit
3. Roads of 80 km/h speed limit experience the most pole collision, and incident likelihood is proportional with traffic volume
   - Consider both the speed limit and road classification when triaging undergrounding of networks for benefit in reducing pole collision risk
4. Car incident is more likely to impact the outside of a road curve than inside
   - Consider placing poles along the insides of curves as much as practically feasible

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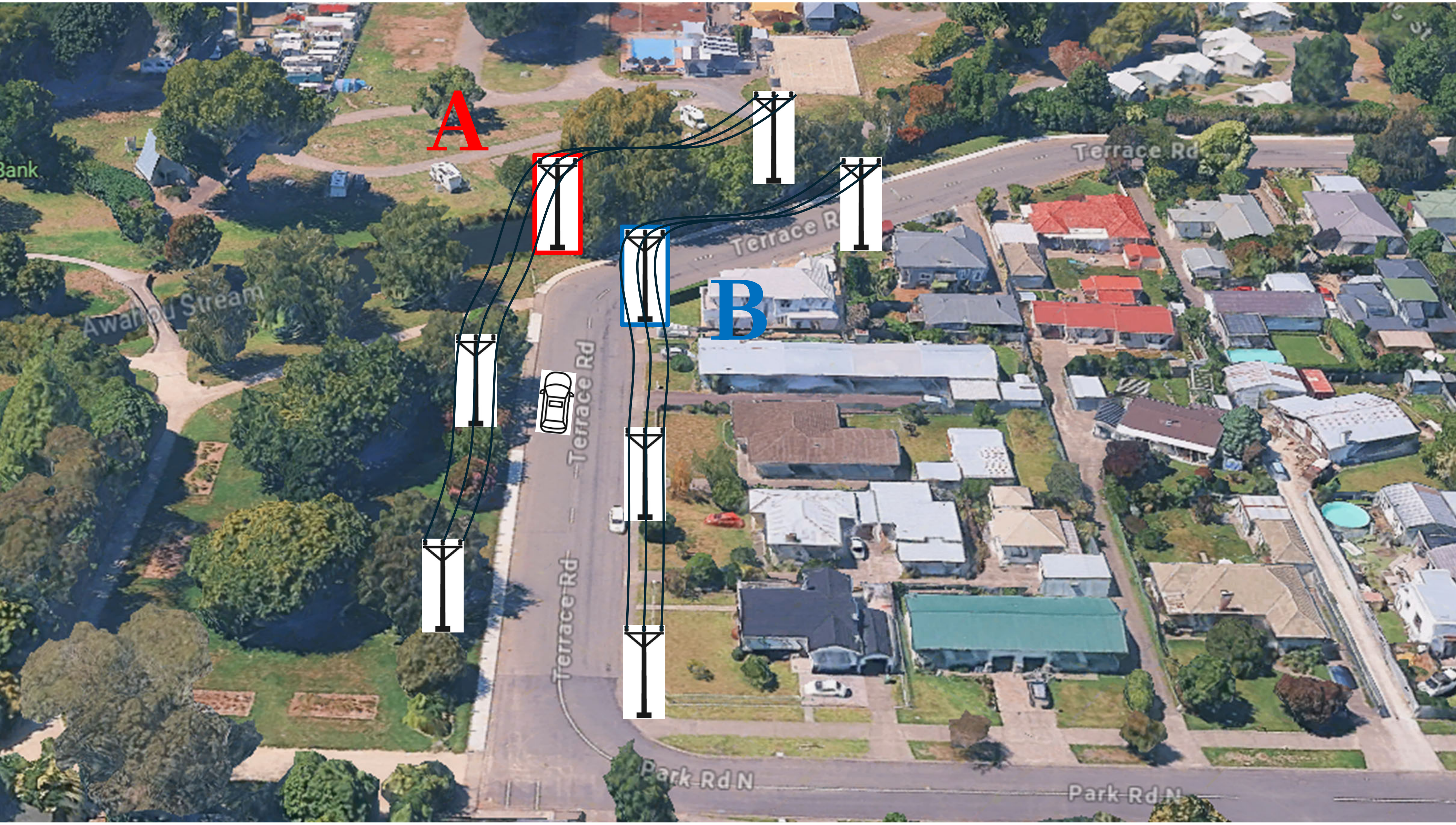
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Thanks for your attention

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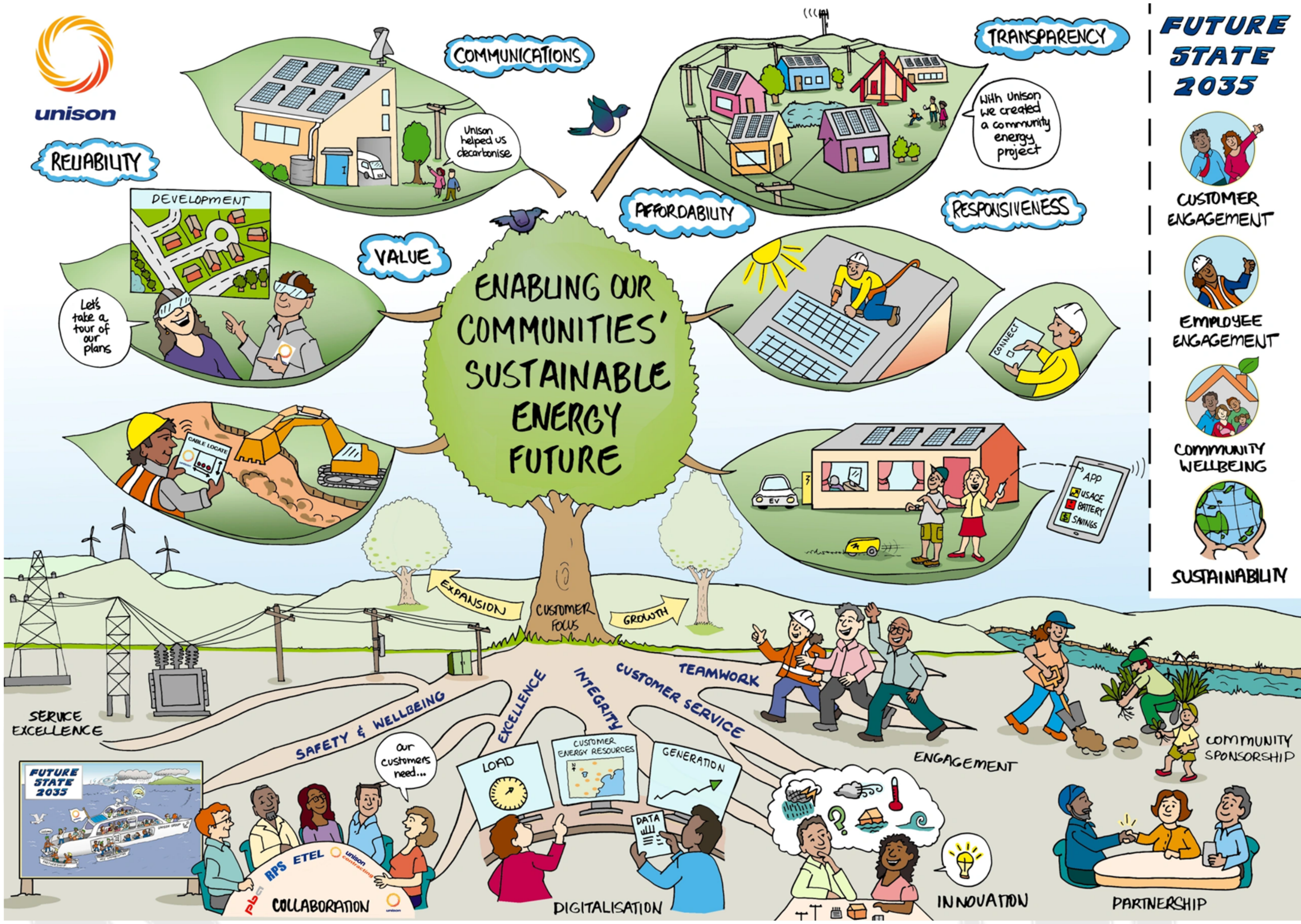

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